

CLAIMS

1. A method of controlling engagement of a starting clutch for a transmission connected to an engine, the method comprising:

5 providing a feed-forward input command as a function of an engine operating parameter;
providing a feed-back input command as a function of measured clutch slip determined from transmission input speed and transmission output speed; and
summing said feed-forward input command and said feed-back input command to determine a clutch control command for controlling engagement of the
10 starting clutch.

2. The method of claim 1, wherein said engine operating parameter is selected from the group consisting of throttle position, gas pedal position, and calculated engine torque.

3. The method of claim 1, wherein said step of providing a feed-back input command further comprises:

5 comparing said measured clutch slip with a reference slip profile which includes a low speed stage in which slip is a function of engine speed such that slip increases along with engine speed to allow the engine to quickly achieve high torque, and a high speed stage in which slip is a function of vehicle speed such that slip decreases as vehicle speed increases until a final desired relatively low slip is reached; and
providing the feed-back input command based upon said comparison with
10 the reference slip profile.

4. The method of claim 1, wherein said starting clutch is a range clutch positioned inside the transmission and is engaged in a first speed ratio, and the transmission is characterized by the absence of a torque converter.

5. The method of claim 1, wherein said starting clutch is a range clutch positioned inside the transmission and is engaged in a reverse speed ratio, and the transmission is characterized by the absence of a torque converter.

6. The method of claim 1, wherein the starting clutch is an input clutch positioned between the engine and the transmission, and the transmission is characterized by the absence of a torque converter.

7. The method of claim 3, wherein said feed-back input command and said feed-forward input command commence when vehicle speed increases from zero.

8. The method of claim 1, wherein said clutch control command controls the hydraulic force applied within the starting clutch.

9. A method of controlling engagement of a starting clutch for a transmission connected to an engine, the method comprising:

5 providing a feed-forward input command as a function of an engine operating parameter;
measuring clutch slip;
comparing said measured clutch slip with a reference slip profile to provide a feed-back input command; and
10 summing said feed-forward input command and said feed-back input command to determine a clutch control command for controlling engagement of the starting clutch.

10. The method of claim 9, wherein said engine operating parameter is selected from the group consisting of throttle position, gas pedal position, and calculated engine torque.

11. The method of claim 9, wherein said reference slip profile includes a low speed stage in which slip is a function of engine speed such that slip increases along with engine speed during launch to allow the engine to quickly achieve high torque, and a high speed stage in which slip is a function of vehicle speed such that slips
5 decreases as vehicle speed increases until a final desired relatively low slip is reached.

12. The method of claim 11, wherein said starting clutch is a range clutch positioned inside the transmission and is engaged in first and reverse speed ratios, and the transmission is characterized by the absence of a torque converter.

13. The method of claim 11, wherein the starting clutch is an input clutch positioned between the engine and the transmission, and the transmission is characterized by the absence of a torque converter.

14. The method of claim 11, wherein said feed-back input command and said feed-forward input command commence when vehicle speed increases from zero.

15. The method of claim 9, wherein said clutch control command controls the hydraulic force applied within the starting clutch.

16. A method of controlling engagement of a starting clutch for a transmission connected to an engine having a throttle, wherein the transmission is characterized by the absence of a torque converter, the method comprising:
5 providing a feed-forward input command as a function of position of the throttle;
providing a feed-back input command based upon a measured clutch slip determined from transmission input speed and transmission output speed;

10 summing said feed-forward input command and said feed-back input
command to determine a clutch control command for controlling engagement of the
starting clutch;

 wherein said step of providing a feed-back input command further
comprises:

15 comparing said measured clutch slip with a reference slip profile
which includes a low speed stage in which slip is a function of engine speed such
that slip increases along with engine speed to allow the engine to quickly achieve
high torque, and a high speed stage in which slip is a function of vehicle speed
such that slip decreases as vehicle speed increases until a final desired relatively
low slip is reached; and

20 providing the feed-back input command based upon said
comparison with the reference slip profile; and

 wherein the starting clutch is an input clutch positioned between the
engine and the transmission.

17. The method of claim 16, wherein said feed-back input command
and said feed-forward input command commence when vehicle speed increases from
zero.